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Register No. :

Name of the Candidate:

POST DIPLOMA / DIPLOMA EXAMINATION, 2010

(CONCRETE TECHNOLOGY AND DESIGN OF CONCRETE STRUCTURE)

(PAPER – II)

520. STRUCTURAL CONCRETE DESIGN – I

December)

(Time: 3 Hours

Maximum: 100 Marks

Answer ONE full question from each unit

(5×20=100)

All questions carry equal marks

Use of IS : 456, IS – 875 codes permitted.

Adopt M₂₀ concrete, Fe₄₁₅ steel

UNIT- I

1. Briefly explain the design procedure for working stress method.

(OR)

2. Draw the strain – stress curve for steel and concrete and explain its characteristics.

UNIT- II

3. A reinforced concrete beam is to be designed over an effective span of 5m to support a design service load of 8 KN/m adopt m-20 grade concrete and Fe-415 hySD bars and design the beam.

(OR)

4. A tee beam slab h_{00r} of an office comprises of a slab 150mm thick spanning between ribs spaced at 3m centres. The effective span of beam is 8m. Live load on floor is 4 kN/m². Using M₂₀ concrete & Fe415 bars, design one of the intermediate tee beams.

UNIT- III

5. Design the one-way slab for the following data.

(i) Clear span = 2.5m

(ii) Slab supported on load bearing brick walls 230mm thick

Loading : Residential floor, 2 KN/m².

Material : M20 grade concrete Fe-415. HYSD bars.

(OR)

6. Design a circular slab of size $4\text{m} \times 6\text{m}$ to carry a live load of 3 kN/m^2 and floor finish of 0.8 kN/m^2 . The thickness of the wall of 230 mm around.

UNIT- IV

7. Design the reinforcement in a short column $400 \times 400\text{mm}$ at the corner of a multistoreyed building to support an axial factored load of 1500 kN, together with biaxial moment at 50 kNm acting in perpendicular planes. Adopt m-20 grade concrete and Fe415 HYSD bars.

(OR)

8. Design the reinforcement in a circular column of diameter 400mm to support a factored moment of 800 kN together with factored moment of 80 kNm. Adopt M₂₀ grade concrete and Fe₄₁₅ HYSD bars.

UNIT- V

9. Design a stair for a room $2.5 \text{ m} \times 4.5 \text{ m}$ the live load is 5000 N/m^2 . Tread is 250mm and rise is 160mm. Steps are at reinforced concrete. Landing slab spans perpendicular to the flight slab, Height of the floor is 3.2 m.

(OR)

10. Write short notes on the following with neat sketches, indicating the merit and demerits.
(a) Open neural stairs (b) Slables stairs
